

Preliminary Report to the Research Committee of the Institute of Pacific Relations

A STUDY OF CONDITIONS IN TIENTSIN

by

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and Economic Research



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The Problem of Industrialization

Industrialization, which may be defined as the application of capitalistic economy of large scale production to manufacture, especially with the aid of power driven machinery, brought about a revolutionary change in the economic life of western nations throughout the whole of the nineteenth century. In China, the process of industrialization did not begin until late in the nineties, and has been confined primarily to the following manufactures, namely, iron and steel, shipbuilding, electric light and power supplying, water supplying, cotton spinning and weaving, silk reeling, flour milling, oil pressing and match making. In other manufactures, such as artificial silk weaving, carpet weaving, hosiery knitting, dyeing and bleaching, machine-making, pottery and glass, paper, soap and candle, brewing and distilling, tobacco, tea, salt making and alkali refining, printing etc., the process has been introduced to a smaller extent. In both groups of industries, however, the effects of industrialization have become more and more visible. The replacement of small workshops by large factories, the substitution of handicraft by machine technique, and the rise of a class of wage-earners in place of the independent craftsmen, all these tend to revolutionize the social and economic life of a nation noted for its economic medievalism. The transformation of the old Chinese gilds into the emoloyers' associations on the one hand, and into the trade unions on the other, indicates the appearance of a class struggle and the rise of a nascent labor movement. The increase of industrial disputes and the resort to strikes and lockouts become a recurring phenomenon of Chinese economic life. The evils of child and woman labor begin to engage the attention of social reformers. The rising cost of living brings forth the issue of a fair wage and income, and calls attention to the importance of a thorough and systematic investigation into the family budgets of the working class. Labor legislation, formerly unknown to Chinese politics, now becomes an integral part of the government's social policy. The development of natural resources, the growth of

new means of transport and increase of modern banking and financial institutions, all these help to foster the manufacturing industries. The rise of such idustries changes the whole outlook of Chinese municipal life, as towns and villages are transformed into industrial centres. There is meantime a cityward movement of population tending towards urbanization, which creates in turn the housing problem. Trade also increases, as well as changes in character. The import of manufactured goods from the foreign industrialized nations tends to decline, as is the case with cotton yarn; the export of raw materials may also come to an end as China begins to feel the need of raw materials for her own manufacture. The change in the general character of China's foreign trade results in a change in her international economic relationship. Great Britain, Japan and the United States, having occupied the first three places in China's foreign trade, are naturally affected by this change to the largest extent. Again, the flow of foreign capital into Chinese industries puts China in the position of a debtor nation. The heavy investment of foreign capital in Chinese railways is responsible for the rapid introduction of a new system of transport, whereas that in Chinese industries, such as cotton spinning and weaving, oil pressing, etc., provides new opportunities for employment to the Chinese labor. The employment of foreign capital has been a moot question, from political viewpoint. But its lasting economic benefits have been amply proven by the American experience. Indeed, the international developemnt of China has been advocated by Dr. Sun Yat Sen, the founder of the Chinese Republic. Under proper control, such development would undoubtedly have been one of the best means to industrialize the nation as well as to hasten her material progress.

Need of Facts on China's Industrialization

Facts, especially those of a statistical nature, are deplorably lacking in China; all that has been said of China's industrialization is chiefly observation not supported by any quantitative investigation. The brief account of its effects may give the impression to one unfamiliar with the Chinese conditions that the extent of China's industrialization must have been quite great, and one is expected to find modern economic institutions in the interior as well as in large treaty ports such as Shanghai, Tientsin and Canton. This, however, is never the

case. China has been barely touched by the revolutionary change of industralization; she is, if we may venture a guess, still a land of economic medievalism. Because of the vast extent of her territorial possessions, China, unlike any of the industrialized nations with the exception of the United States, is unaffected by instant changes. The slowness of the change and the vastness of its extent, promise a fertile field for investigation. Such investigation, if carried on systematically without interruption, and with the aid of modern methods of scientific research, will not only bring new contribution to the field of economic theory and history, but will also have a practical bearing upon the solution of manifold economic problems inherent to industrialization. China is backward in her industrial development and material progress, but because she is backward she may profit by the experience of other nations whose fruits of industrialization have been realized only after the painful cost of experimentation, cost of trial and error. The class struggle, which by its very nature is perhaps unavoidable, may be mitigated if not eliminated by a better understanding of its past history in other nations. So are the evils of child and woman labor under a laissez faire government. The pains of transition, such as those arising from the displacement of handicraft by machine labor, should not be fully felt in China, as they had been in western industrialized nations. All these, however, could not have been possible without a knowledge of the factual conditions existing in the different walks of Chinese economic life.

Field Investigation for Industrial and Commercial Centres

The importance of field investigation into China's industrialization, both from academic and practical viewpoints, cannot be disputed. But the vast scope of the investigation in view brings up instantly a problem that requires careful consideration. China, which may be called a nation of nations, is geographically composed of many districts, each of which varies in economic resources and development. In fact, each 'fu' (片) or 'hsien' (梨), not to say each province, is from the financial viewpoint a nation by itself. The customs barriers that exist between different 'fu' or 'hsien', under the evil likin system, may

be taken as an illustration. A carpet manufactured in Peiping, for instance, has to pay three local taxes before it is finally transported to Tientsin. For an investigation into the extent and effects of industrialization, however, China may be divided into different regions according to the presence of leading industrial and commercial centres. Thus, Shanghai constitutes a district by itself, as it is the leading port for China's foreign trade, as well as the chief centre for China's modern industries such as cotton spinning and weaving, silk reeling, and flour milling. Similarly, Tientsin, Tangshan, Dairen, Mukden, Harbin, Wuhan, Wusih, Tungchanhai, Canton, etc. may respectively form the nucleus for field investigation into China's industrialization. Shanghai, Wusih, Tungchanhai, Wuhan, Tientsin and Tsingtao are the chief centres for China's cotton industry, whereas Shanghai, Wusih, and Tientsin are also flour milling centres. In Shanghai, Wusih and Canton, the silk reeling industry is centred; in Dairen, the oil pressing industry. Tangshan is the coal mining centre, while Wuhan is noted for its iron and steel works. Each centre, because of its different industrial and commercial structure, may thus be taken as a unit for field investigation into China's industrialization. Again, each industry is different from the other in nature as well as in extent; it has its own individuality that does not permit an investigation that simultaneously takes into account of other industries. Each industry, because of its individualistic character, must be studied by itself in order to see the effects of industrialization in that industry. speaking, industries may be carried on in factories or in workshops, under handicraft or machine production. The difference in technique as well as in organization in different industries, even in one centre, results in a difference in the effects arising from industrialization.

Investigation on China's Industrialization in Tientsin

Tientsin, as one of the leading industrial and commercial centres, constitutes a region by itself for the purpose of studying the extent and effects of industrialization by means of field investigate chosen in preference to other industrial and commercial centres chiefly because of the Committee's location in Tientsin, and of the facilities

for research it offered. Through the efforts of the Institute of Pacific Relations, the Committee is fortunate in securing for the investigation a grant of 8,000 gold dollars per year for three years from the Laura Spelman Rockefeller Memorial Foundation. With this grant, the Committee began its work for field investigation on the first of June, 1929. But before this date, steps were taken to define the scope of the Committee's investigation, to organize the personnel, and to formulate a definite plan for investigation. First of all, it was decided that because of the uncertainty that attached to the word 'industrialization', a working definition should be given to it for practical purposes. Industrialization, accordingly, was defined as the application of capitalistic economy of large scale production to manufacture, especially with the aid of power driven machinery. Under this definition, the field to be covered by the Committee's investigation relates only to manufactures, not to any other branch of economic activities. These manufactures, meantime, must have been affected by the capitalistic economy of large scale production, partly if not wholly, before they are chosen by the Committee for investigation. The next step, which relates to the choice of manufactures such as fall within the Committee's definition. is a more difficult one, and can only be undertaken with a view to expediency rather than to scientific accuracy. In China, statistics of a social and economic nature have until recently been a novelty. The most fundamental statistics for any modern nation, such as the census on population and occupation, are not to be found in China. In Tientsin, for instance, no one knows exactly the actual number of residents, and the number of people engaged in various occupations. A resident well versed in the economic conditions of Tientsin may be able to enumerate the leading industries in Tientsin, such as cotton spinning and weaving, machine flour milling, artificial silk and cotton weaving, and carpet weaving. In rare case, he may even be able to give an estimate on the extent of each of these major industries in Tientsin. But further than these, no statistics can be obtained except through field investigation. Under such circumstances, the Committee is faced with the task of having to conduct a preliminary survery into the Tientsin industries, in order to determine the industries for investiga-

tion. A survey of this nature, which in western nations is generally undertaken by the government, can hardly be well executed by a private organization such as the Committee. Again, a government organization may exercise its police power to obtain information if necessary, whereas a private organization, such as the Committee, is helpless when the industry, for business or other reasons, fails to supply it with the statistics required. For these reasons, a preliminary survey of the Tientsin industries by the Committee is for the time being out of question. Fortunately, at a time when the Committee was faced with this difficulty, the Social Affairs Bureau of the Special Municipality of Tientsin, with the publication of the results of an investigation conducted into the Tientsin factory industries during the winter of 1928, came to the rescue of the Committee. The report, however, covers the factory industries in the Chinese city of Tientsin only, not including those in the foreign settlements such as British, French, Japanese and Belgian. Again, what is taken as factory industry by the Bureau is after an elementary examination not factory industry in common usage. Of the forty-four factory industries included in the report, there are, for instance, two industries with three workers each, one industry with four workers, two industries with five workers each, two industries with six workers, each, one industry with seven workers and one industry with nine workers. In the third place, the survey into some of the factory industries must have been highly incomplete. The carpet weaving industry, according to the Bureau's investigation, employs a total of 3,807 workers only. But according to an investigation recently completed by the Committee, the industry employs a total of 11,568 workers. In defense of the Bureau's investigation it may be said that one sixth of the 11,568 workers are not found in the Chinese city, the territory as covered by the Bureau's investigation, but in foreign settlements. Finally, several factory industries of major importance in Tientsin, such as machine flour milling, electric light and power supplying, are not covered by the Bureau's investigation.

Table I. Factory Workers in Tientsin, 19281.

Name of Industry	Ad		Child	Total	
AND OF FINANCES	Male	Female	(under 16)	10001	
Cotton Sp nning & Weaving 2 Artificial Silk and Cotton	13,497	1,812	1,459	16,798	
Weaving 3	6,731	152	1,601	8,514	
Carpet Weaving Match Making	2,792 1,769	44	971	3,807	
Hosiery Knitting	713	58	422	1,877	
Iron Founding & Working	790		246	1,036	
Dyeing	464	24	138	626	
Ribbou Weaving Furring	304 173	9	190	494 248	
Mat Weaving	112	19	112	243	
Soap Making	154	5	17	176	
Sail Cloth Weaving Cotton Carpet Weaving	145 50		30 120	175	
Tanning	144	The second second	120	170 148	
Printing	99	r mybeth	29	128	
Coppersmith & Blacksmith	57 101	Pennino S	53	110	
Flour Milling (native) Brass Gauze Making	80	art Show	shrink affi	101	
Brick and Tile Making	68	A. Commission	4	72	
Cotton & Silk Rail Making	55	2	7	64	
Shuttle Making Comb Making	32 32	9	29	61	
Other 23 industries	322	57	82	52 461	
pairmotion attempted though	sontpol/stow	a ment	received a p	therouties	
Total	23,714	2,221	5,699	36,634	

- Social Affairs Bureau, Special Municipality of Tientsin, Tientsin Factory Industries, in a Report titled "Native Products" (國貨一號), 1929.
- 2. Weaving by power looms.
- 3. Weaving by handlooms.

Despite the obvious shortcomings of the returns on the Tientsin factory industries as compiled by the Social Affairs Bureau of the Special Municipality of Tientsin, the Committee, because of the absence of a better order of statistics, has taken the Bureau's returns as an approximate guide in determining the industries for the Committee's investigation. In so doing, several qualifications would have to be borne in mind. First of all, are the factory industries 'industrialized'?

That is, have they been affected by the capitalistic economy of large scale production, especially with the aid of power driven machinery? This question may be answered in the affirmative, but it gives rise to a second one that defies solution. What, for instance, is the factory system, and what is implied in the term 'factory industry'? According to professor Ashley the essential feature of the factory system is "the aggregation of a body of workpeople in one workplace, drawn together by the necessity of attendance upon power machinery, and directed by capitalist employers".1 This definition brings out the three key elements of the system, namely, labor concentration, supervision and employment of power machinery. as a working definition for practical purpose, it falls short of a mechanical means for differentiation. In England, for instance, the presence of mechanical motive power, or the number of workers, has been employed as an index of the factory system. In China, the Ministry of Industry, Commerce and Labor has recently proposed to embody in its labor code the definition that a factory shall be an industrial establishment employing thirty or more persons. For the purpose of the Committee's investigation, Professor Ashley's definition may serve as a guiding principle, whereas the Ministry's helps to differentiate a factory from a workshop. In choosing the industries for the Committee's investigation from the list of Tientsin factory industries as compiled by the Social Affairs Bureau of the Special Municipality of Tientsin, both definitions are constantly kept in view wherever possible. In this way, four industries, namely, cotton spinning and weaving, artificial silk and cotton weaving (or handloom weaving), carpet weaving and hosiery knitting, are chosen for investigation during the present academic year, 1929-1930.

Organization and Direction of the Personnel

The personnel in charge of the investigation on China's industrialization in Tientsin is composed of two directors, eight field investigators, one computer and one typist. In the following list the names and history of the staff members is given.

^{1.} Ashley, Economic Organization of England, 1914, p. 154.

Directors:

Franklin L. Ho, B. A. (Pomona), 1922; Ph. D. (Yale), 1926; Professor of Public Finance and Statistics, Nankai University; Director, Nankai University Committee on Social and Economic Research

Hsien Ding Fong, B. S. (N.Y.U.), 1924; Ph. D. (Yale), 1928; Prefessor of Economic History, Nankai University; Assistant Director, Nankai University Committee on Social and Economic Research

Investigators:

H. S. Lin, formerly assistant chief, Statistics Division, Social Affairs Bureau of the Special Municipality of Tientsin (hereafter abridged as S. D. S. A. B.)

Y. C. Hang, formerly investigator, S. D. S. A. B.

H. C. Wong, formerly investigator, S. D. S. A. B.

S. S. Lee, formerly investigator, S. D. S. A. B.

Y. Y. Chuan, formerly investigator, S. D. S. A. B.

C. Wong, formerly investigator, S. D. S. A. B.

C. T. Lin, formerly investigator and computer, Nankai University Committee on Social and Economic Research

T. L. Shang (Miss)

Computer and typist:

T. Y. Lee, Computer

Y. N. Hua, typist

With the exception of Mr. C. T. Lin and Miss T. L. Shang, the other six investigators were formerly investigators for the Statistics Division, Social Affairs Bureau of the Special Municipality of Tientsin. All of them had a high school education, in addition to their experience in social and industrial investigation, varying from several months to a few years. They were recruited from a large number of applicants, and were admitted only after they had passed an oral examination given by the Directors of the Committee. After having passed the oral examination satisfactorily, each of them was required to submit a report on the industry that he had investigated for the Bureau. The report must, first of all, be confined to facts, and secondly, it

must show the applicant's ability to analyze such facts with systematic accuracy. Each of the six investigators met the requirements, and was accordingly admitted into the Committee. Immediately after their admission the investigators were placed under the supervision of Dr. H. D. Fong, with regard to their work in field investigation.

The Method of Procedure

The method of procedure for the investigation into the four industries, namely, cotton spinning and weaving, artificial silk and cotton weaving, carpet weaving and hosiery knitting may next be described. First of all, the investigators' reports on the industries that they had investigated for the Bureau, which happened to deal with the four industries chosen for the Committee's investigation, were taken as a basis for formulating definite plans. From a brief analysis of these reports, major divisions for the investigation of each industry were mapped out, namely, history, technique, industrial organization, marketing methods, labor and labor conditions, employers' association, government and industry. Several lines of approach, meantime, were also decided upon, including (1) the filling out of questionnaire blanks by means of personal inquiry, (2) the copying of records, and (3) the writing of reports on special topics not subject to quantitative treatment.

The first line of approach—the filling out of questionaire blanks by means of personal inquiry—has thus far been applied to the investigation of the industrial establishment, the worker and the apprentice. Questionaire blanks, a sample copy of which has been translated from Chinese into English and attached to this report as appendices A. B. C. D. are formulated after analysis of the reports on the various industries submitted by the investigators, and of the questionnaire blanks of a similar nature collected from other research agencies. Generally speaking, the questionnaire blank on the industrial establishment relates to its location, year of establishment, amount of capital, number of looms, number of workers and apprentices, amount of raw materials consumed, amount of output produced etc.; that on the worker or apprentice relates to nativity, age, sex, skill, marital status, size of family, year of admission, wage

and income, hours of work etc.

The second line of approach—the copying of records—has thus far been confined to the factory records on wages, leaves of absence, dismissals, fines and rewards; to the union records on members; and to the factory hospital records on the workers' health. Such procedure, of course, must by its very nature be of a limited application. In China, where statistics have been very scanty in practically all walks of national life, the keeping of systematic records is an unusual business practice with small establishments, whether industrial or commercial. In large establishments where records are being kept year after year, they are at times too brief to be of any value for social and economic investigation. Furthermore, they are not faithfully preserved for a long period of time.

The third line of approach—the writing of reports—is applied to certain aspects of the investigation that are not subject to quantitative treament, but can be investigated only by means of personal conversation with those engaged in the various departments of the industry. Each investigator, for instance, is assigned a certain topic every two weeks, on which he is to submit a report of about one or two thousand words. The report is submitted during the investigator's weekly conference with the directors. The latter read it over carefully, and may give whatever criticism or suggestion for improvement if necessary.

Progress of Investigation on Different Industries

Four industries in Tientsin, namely, cotton spinning and weaving, artificial silk and cotton weaving, carpet weaving and hosiery knitting, have been chosen for investigation by the Committee. The investigation into the carpet weaving industry was commenced in the winter of 1927, suspended, and renewed in May, 1929. It was concluded in June, 1929, at a time when the investigation into the other three industries had just begun. The method of procedure adopted for the investigation of the carpet weaving industry has been explained in a preceding paragraph. As the first industry that was ever investigated by the Committee, it necessarily had to pay the cost of experimentation,

cost of trial and error. The report on the 'Tientsin Carpet Industry' has been written, and is now available for distribution. It is divided into seven chapters, namely, history and localization, industrial organization, manufacturing processes, carpet and carpet marketing, carpet workers, organizations of capital and labor, recapitulation and suggestion for improvement. In the following paragraphs the progress of the Committee's investigation on the other three industries, namely, cotton spinning and weaving, artificial silk and cotton weaving, and hosiery knitting, is sketched in brief.

Cotton spinning and weaving, as the largest factory industry in Tientsin, is the most important of the three industries under the Committee's investigation. Tientsin, according to the Eighth Annual Returns of the Chinese Cotton Millowners' Association for 1928, is the fourth cotton manufacturing centre in China, next only to Shanghai, Tsingtao and Wuhan, and has six cotton mills employing a total of 16.798 workers.1 These mills include Yu Yuan (裕元) (6,083 workers), Heng Yuan (恆源) (3,200 workers), Hua Hsin (華新) (2,235 workers), Pei Yan (北洋) (1,950 workers), Yu Ta (松大) workers), and Pao Cheng (曾成) (1,630 workers). Because of the extensive scope of the investigation, the Committee has commenced its work first with the labor conditions in one of the six cotton mills, Yu Yuan Cotton Mill. latter, employing 6,083 workers, is also the largest, and offers the best opportunity for investigation because of the cordial co-operation from the capital and the labor alike. Four investigators, including one lady, have been appointed to undertake this investigation, starting with the labor conditions such as employment systems, labor turnover, wages, cost of living, working hours, child and woman labor, education, recreation, industrial health and sanitation, labor unions, etc. So far, these investigators have been engaged in copying the factory records on wages, labor turnover, fines and rewards, leaves of absence; labor

^{1.} The Eighth Annual Returns of the Chinese Cotton millowners' Association gives a total of 16.018 workers, but the present figure, 16,798, as given by the Social Affairs Bureau of the Special Municipality of Tientsin, is more recent and therefor preferable.

union records on members; and hospital records on workers' sickness. They have also been engaged in making preliminary survey of the workers living in factory dormitories with or without families. This survey will serve as a basis for sampling workers' families with a view to investigating their family budget and cost of living.

The artificial silk and cotton weaving industry, according to an investigation recently completed by the Social Affairs Fureau of the Special Municipality of Tientsin, employs a total of 8,512 workers. This figure is probably correct. The Committee, since the beginning of its work on industrialization project in June, 1929, has appointed three investigators to undertake the investigation into this industry, who have up to the present (September 25, 1929) investigated 163 establishments of varying size, employing a total of 3,876 workers of whom two thirds are apprentices. Of these 163 establishments, 123 have less than thirty workers per establishment, and employ a total of 2,177 workers, or 56 percent. In Table II, the distribution of the artificial silk and cotton weaving establishments according to the number of workers per establishment is given.

Table !!. 163 artificial silk and cotton weaving establishments in Tientsin classified by number of workers per establishment, 1929

Workers per establishment	No. establishments	No. workers
Below 10 10 - 19	39 55	230 778
20 - 29 30 - 39	29 19	691 627 333
50 - 59 60 - 69	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 249
70 - 79 80 - 89 90 - 99	miner rate 1 and a	70
$ \begin{array}{r} 100 - 109 \\ 110 - 119 \\ 120 - 129 \end{array} $	1 2 1	204 110
130 - 139 140 - 149	2 1020	284
150 - 159 160 - 169	to deposit of	160
Total	163	3,876

The investigation into this industry has thus far been conducted by means of questionnaire blanks and reports. Each investigator is given three questionnaire blanks, one on the establishment, a second on the worker and a third on the apprentice. In visiting each establishment, whether a workshop or a factory, he is told to fill out the questionnaire blanks with all the details required, such details being obtained by tactful questioning and instant recording. Because of the large number of workers and apprentices in the whole industry, it would have been impossible to interrupt all instead of a part of the workers for the purpose of questioning. A proportion is therefore determined, and in every establishment only one out of every six workers or apprentices is questioned, the selection being made at random. In this way, 591 workers and apprentices, out of a total of 3,876, have been investigated. Besides the filling out of the questionnaire blanks, every investigator is required to report on one specific topic assigned to him every two weeks, in order to collect information on subjects that cannot be treated quantitatively. Thus, the following topics have been reported by the three investigators up to the present.

- 1. A brief history of the artificial silk and cotton weaving industry.
- 2. The present business condition of the industry.
- 3. The merchant employer system in the industry.
- 4. The financing of an artificial silk and cotton weaving establishment.
- 5. The character and supply of managers for the industry.
- The Jaquard loom, its variety, technical structure, and marketing.
- 7. The classification of fabrics woven of artificial silk and cotton.
- 8. Marketing the artificial silk and cotton fabrics.
- 9. The seasonal fluctuation of prices in artificial silk and cotton fabrics.
- 10. The peddlers in artificial silk and cotton fabrics.

- 11. The history of likin taxes in artificial silk and cotton fabrics.
- 13. How the workers amuse themselves on holidays.
- 14. Industrial health and sanitation in the industry.

The hosiery knitting industry in Tientsin, according to the investigation of the Social Affairs Bureau of the Special Municipality of Tientsin, employs a total of 1,193 workers. This figure is an underestimate, including perhaps seventy percent of the workers. The Committee, up to the present, has already investigated 105 establishments of varying size, employing a total of 1,359 workers. Of these 105 establishments, 98 have less than thirty workers per establishment, and employ a total of 1,071 workers, or 79 percent. The other seven establishments have thirty or more workers per establishment, and employ a total of 288 workers, or 21 precent. In Table III, the distribution of the hosiery knitting establishments according to the number of workers per establishment is given.

Table III. 105 hosiery knitting establishments in Tientsin classified by number of workers per establishment, 1929

51 36 11	323 508 240 130
56 11 (alonth)	240
4	190
	100
1	43
mental and an analyst	54
mande of more made	61
Control of the same of the sam	1,359
	105

The procedure adopted for the investigation of the hosiery knitting industry is the same as that for the artificial silk and cotton weaving industry. Only one investigator, however, is appointed to undertake this investigation. Thus far, 105 establishments, employing 1,359 workers and apprentices, have been investigated by means of questionnaire blanks. Of the 1,359 workers and apprentices, 248 have been similarly investigated. Reports, meantime, have been written on the following subjects.

- 1. A brief history of the hosiery knitting industry.
- 2. The factors for the decline of the industry.
- 3. The present business condition of the industry.
- 4. The small workshops in the industry.
- 5. The outworkers and the middlemen—the merchant employer system.
- 6. The financing of a hosiery knitting establishment.
- 7. The history of hosiery knitting machine in Tientsin.
- The raw materials: variety, source of supply and purchasing methods.
- 9. The commercial middleman and marketing.
- 10. The disadvantages of apprentice labor.

Plan for Further Investigation

The progress of the Committee's investigation into the four industries in Tientsin, namely, cotton spinning and weaving, artificial silk and cotton weaving, carpet weaving and hosiery knitting, has not been at all uniform. The investigation on the carpet weaving industry has been completed, while that on the other three industries will take from one half to two years more for completion. The hosiery knitting industry, being the smallest in extent, will take another half year before the results of the investigation can be put together for analysis and report. The artificial silk and cotton weaving industry is about five times larger than the hosiery knitting industry when measured by the number of workers in the industry, but being in charge of three instead of one investigator, its investigation may also be completed within another half year. The cotton spinning and weaving industry is two times larger than the artificial silk and cotton weaving industry and ten times larger than the hosiery knitting industry, when measured by the number of workers employed. This industry, above all others, will take the longest time for completion. It is not only the largest industry in Tientsin, but also the most completely industrialized. The concentration of this industry in a group of only six establishments. employing a total capital of 20,990,000 dollars, 223,000 spindles, 1,200 looms, a motive power of 10,750 kilowatts and 9,050 H. P., a labor

bales of cotton yarn and 870,000 'pi' (E) of cotton cloth, is an excellent index of the capitalistic economy of large scale production. It promises a fertile field for investigation, and even with four investigators at work in this industry, it will take the Committee at least another year for completion.

The four industries that have been investigated by the Committee do not exhaust the list of Tientsin industries that have been affected by the process of industrialization. At the completion of the Committee's investigation into these industries, other important industries will be taken up for investigation, especially machine flour milling, electric light and power supplying, brick and tile making. The Committee, in justifying the generous grant of 8,000 gold dollars per year for three years from the Laura Spelman Rockefeller Memorial Foundation, will attempt to cover every industry in Tientsin that may have come under the influence of industrialization. At the conclusion of the Committee's investigation into the Tientsin industries partly or wholly affected by industrialization, a summary report on the extent and effects of industrialization in Tientsin industries will be written.

The investigaton on the extent and effects of industrialization in Tientsin, however, serves but as a starting point for a similar investigation applicable to China at large. If after the end of the three year period, the investigation in Tientsin proves to produce fruitful results, which the Committee has confidence to believe in the affirmative, it is the earnest request of the Committee that a further extension of the Committee's work to China at large be granted by the Research Committee of the Institute of Pacific Relations, under which the Tientsin project has been carried out by the Nankai University Committee. The latter in a data paper to be submitted to the Biennial Conference of the Institute of Pacific Relations in October, 1929, has, in anticipation of such a grant, outlined the program of field investigation for China as a whole in the following terms: The Committee plans to divide the whole nation into different industrial centres such as Shanghai, Tientsin, Wuhan, Canton, Wusih, Tsingtao, Dairen, Mukden, Tungchanhai, Tanshan, etc. In each of these industrial centres, such

industries as have been affected by modern economy of large scale production will be taken up for investigation. Each industry in each centre will constitute an independent unit for field investigation, for which the following topics in particular will be covered, namely, history, technique, industrial orgnization, marketing methods, labor and labor conditions, employers' association, government and industry. After having completed the field investigations of the same industry in different centres, a summary report of that industry will be issued, but in some cases where the industry is located in one centre, a separate report will be issued at the completion of its investigation in that centre. Thus, step by step, all modern industries in the leading industrial centres of China will have been investigated and reported at the end. From the reports on these various industries, a summary report on the extent and effects of China's industrialization will be written."

^{1.} Ho, Franklin L. and Fong, H. D., Extent and Effects of Industrialization in China, 1929, pp. 32-33.

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APPENDIX

APPENDIX

Job classification oxidentees apprentices

Questionnaire Blank for the Artificial Silk and Cotton Weaving Establishment

Compiled by the Nankai University Committee on Social and Economic Research, Tientsin, China

Name of investigator

Date of investigation

- 1. Name of establishment manager
- Location Name of
- 2. Year of establishment Amount of capital paid up Form of organization (individual proprietorship, partnership or corporation)
- 3. Weaving on own account or on that of other establishment
 - a. Name of other establishment Is work given out directly by the other establishment or through the middleman?

Commission for the middleman

b. Does the establishment give out work in addition to weaving at own establishment?

Is the work given out by the establishment directly or through the middleman?

Commission for middleman output: by own establishment ment % Percentage of last annual % by other establish-

4. Number of looms during the last five years: 1924

1925

1926

1927

1928

Present number of looms

		Purchasing price	Manufacturer of loom			
Kind	Number	The table	Name	Nationality		
			-			

5. Is the premise owned or rented?

Amount of annual

6. Number of workers: male

Number of apprentices: male

female female

Job classification of workers and apprentices

Job	No. workers and apprentices						
Man Cinn Date of th	WE ASSESSED SEEDING OF SERVICE SOLVE						
M) LEGALON.	Saverne makes 10						

7. Wage according to piece rate:

In month

Kind of fa	brics woven	HIDSON BY	of the latest	100
Wage rate	A Depote of	10 THE	y locamen	THE STATE OF
Regular	1		V-bar	
Overwork	escalable.	edi sol s	ofesi/mmoU	

Does the establishment provide for the workers' room and board? If so, estimate the monthly cost of room and board per worker

- 8. Working hours from A.M. to P.M.

 Do the above hours include meal hours?

 Hours
 spent for taking meal.
- 9. Raw materials consumed for the last year:

he set the

Kind	Purchasing price per catty or pound	Quantity	Total value	lue Name of firm selling		
				*		
and in the	Imponent (10)	printer be	No saldionia	1 A		

10. Output produced for the last year:

Kind	Trade-	Measure	each 'pi'	Quantity	riginal	Selling	Name of firm	
Kind	mark	L.	W	(mi)		price	buying	
100	- C. F.	padience.	a nain	wind ind	table and	A FOR	Quag Contra	
		10.3	TOPE N	arasi, ali o	Allow Land	bara	1	
-	with			-	A CONTRACTOR OF THE PARTY OF TH	Total Dispersi		
1			1	-				
A. Francisco		The same of	1					
30E	12.00	1	100	A design	di Maria	The rest		
well the	- 14 5 4	mild make	Signature .	Sandilla Hart	Land	as ione		

11. Which season is the busiest for the establishment?

Kind of fabrics woven during different seasons

Spring

Summer

Fall

Winter

12. Does the proprietor's family reside in the establishment?

If so, do the family members work for the establishment?

and who?

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claim terminant by vederant ."

- 13. Suggestions for the improvement of the industry
- 14. Further notes.

APPENDIX R.

Questionnaire Blank for the Hosiery Knitting Establishment

Compiled by the Nankai University Committee on Social and Economic Research, Tientsin, China

	Name of	of in	vestiga	tor		Date	of inv	restiga	tion	
1.	Name o	f esta	ablishm	ent	Loca	tion	Nan	ne of r	mana	ige
2.	Year o	f esta	ablishm	ent A	Amount	of ca	pital pa	id up	F	orn
	of orga	nizat	ion (i	ndividu	al pro	prietor	ship, 1	partner	ship	0
	corpora	tion)	100							
3.	Percent	age	distribu	tion of	annua	al outp	out:-			
	Socks a	and s	tocking	s: cott	on %	wo	ol %	sil	k	%
	Gloves		% Sv	veaters		% Pa	nts	%		
	Mufflers		% C	aps an	d hats		% Oth	er	%	
14.	Number	of h	nosiery	knittin	g mad	hines	during	the 1	ast	five
ters per	years:	edd :								
	1924	1	925	19	26	195	27	192	8	
5.	Present	numb	per of	hosiery	knitti	ng ma	chines	STATE .	.81	

Kind	Number	Purchasing price	Manufacturer		
Axing	Number	per machine	Name	Nationality	
		*		1	
	The Paris de				
-	100				
-					

							4				
6.	Is	the	premise	owned	or	rented?	*	Amount	of	annual	rent

7. Number of workers: male female

Number of apprentices: male female

Job classification of workers and apprentices

	Job	No. workers and apprentices
		For a second sec
-		
		•
	The state of the s	

- Percentage distribution of methods for giving out work by the establishment (especially for sewing):
 - a. Outworker receives work from the establishment %
 - b. Manager takes work to outworker's family %
 - c. Manager sends employee to take work to outworker's family %
 - d. Manager hires middleman to give out work to outworker's family %

Percentage distribution of types of middlemen

- a. Distributing work without knitting %
- b. Distributing work with knitting %

Commission for the middleman

- Working hours from A. M. to P. M.
 Do the above hours include the meal hours? Hours spent for taking meals
- 10. Raw materials consumed during the last year:

Kind	Quantity	Total value	Selling firm		
	quantity	10000 70000	Nationality	Nature	
Wool yarn	of the sea		A of ago at		
Silk yarn	1				
Cotton yarn				de la leg	
Dye & dyestuff	NAME OF			distance in	
Other					

11. Output produced during the last year:

Kind	Trademark	Quantity	Original cost	Selling price	Firm buying
d sho	w day unigh.	mil abording	to police	Critati ou	The same of the sa

12. Which season is the busiest for the establishment?

Kind of output during different seasons:

Spring

Summer

Fall

Winter

- 13. Does the proprietor's family reside in the establishment?

 If so, do the family members work for the establishment, and who?
- 14. Suggestions for the improvement of the industry
- 15. Further notes.

APPENDIX C.

Questionnaire Blank for the Worker

Compiled by the Nankai University Committee on Social and Economic Research, Tientsin, China

Name of investigator Date of investigation Name of establishment

- 1. Name of worker Address Department of work
 Nature of job
- 2. Nativity Number of years in Tientsin Reason for coming to Tientsin
- 3. Year of admission Occupation of recommender
 Your relationship to recommender Recommending fee
- 4. Occupation before admission Training received for present job Time spent for training
- 5. Number of times unemployed within last five years:

	Cause for unemployment	Period of unemploy ment
First time		
Second time		
Third time		strengt at misses and the
Fourth time		
Fifth time		

How do you maintain your livelihood during the period of unemployment?

- 6. Age Sex Marital status Family members:
 father mother husband or wife children
 brothers sisters other
- 7. Have you joined the union? Why or why not?
- 8. Wage: piece rate Daily output: pieces Total daily wage
 Monthly wage: a. at present b. during time of admission
 Are your room and board provided by the establishment?
 Approximate monthly cost for room and board

Statistics on wage increase since admission

Textself	Date	Cause	Amount
First time	March Translate	THE PARTY OF	
Second time	Internal T		
Third time	1	The section of the section of	Is her summer
Fourth time			
Fifth time		- Continue and a	

- Working hours from A. M. to P. M.
 Do the above hours include the meal hours? Time spent for taking meals
 - Number of holidays during the year What are the holidays?

 Amount of savings Amount of debts Property owned
- 10. Amount of savings Amount of debts Property owned Approximate value of property owned
 - 11. Family members gainfully employed other than yourself:

Family member	Sex	Age	Occupation	Annual wage
start engineers to f	night Amount	reviguani,	Causes You	
				emit sent
THE RESERVE				ensu herosad il
		1		Sinte Length
				Popular time

At what age were you first employed gainfully? How much money do you remit home for living expenses? Does this remittance include your own expenses?

- 12. How many times have you been injured on account of work since admission? Nature of injury What compensation did you receive from the establishment for injury?
- 13. How many times have you been sick on account of work since admission? Nature of sickness What sickness do you have at present? Who pays the medical expense? Does the establishment deduct your wage during period of sickness? What recreation do you have after work?
- 14. Further notes

APPENDIX D.

Questionnaire Blank for the Apprentice

Compiled by the Nankai University Committee on Social and Economic Research, Tientsin, China

Name of investigator Date of investigation Name of establishment

- Name of apprentice Age Nativity Year of admission Employment before admission
- 2. Family members: father mother brothers sisters sisters on-laws other
- 3. Family members gainfully employed other than yourself:

Family member	Sex	Age	Occupation	Annual wage

- 4. Occupation of recommender Your relationship to recommender

 Amount of recommending fee
- 5. Occupation of guarantor Your relationship to guarantor Amount of guarantee fund
- 6. Term of apprenticeship Apprenticeship fee
- 7. Provision for living expenses by the establishment: clothing board room other
- 8. First year wage Second year wage Third year wage
- 9. Nature of work

First half year Second half year
Third half year Fourth half year
Fifth half year Sixth half year

Who teaches you the craft? Method of teaching

10. How many times have you returned home after admission?
Has any of your family members come to visit you after your

admission, and who? How many times has he already visited you?

- 11. How many times have you escaped from your work since admission, and why?
- 12. How many times have you been sick on account of work since admission? Nature of sickness Who pays the medical expense? What sickness do you have at present?
- 13. How many times have you been injured on account of work since admission? Nature of injury What compensation did you receive from the establishment for injury?
- 14. How does the establishment treat you?
- 15. Further notes







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